

## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



REC'D 21 MAR 2006

WIPO

PCT

|   |   |   |                       |
|---|---|---|-----------------------|
| Applicant's or agent's file reference<br>ER-21398-PCT   | <b>FOR FURTHER ACTION</b>   |   | See Form PCT/IPEA/416 |
| International application No.<br><b>PCT/KR2004/001949</b>   | International filing date(day/month/year)<br><b>03 AUGUST 2004 (03.08.2004)</b> | Priority date (day/month/year)<br>05 NOVEMBER 2003 (05.11.2003) |                       |
| International Patent Classification (IPC) or national classification and IPC<br><br><b>G06F 12/02(2006.01)i</b> |   |   |                       |
| Applicant<br><br><b>ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE et al</b>                             |   |   |                       |

|   |  |
|---|--|
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |  |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>   |  |

|  |  |
|--|--|
| Date of submission of the demand<br><br><b>29 MARCH 2005 (29.03.2005)</b>  | Date of completion of this report<br><br>03 MARCH 2006 (03.03.2006)  |
| Name and mailing address of the IPEA/KR<br> Korean Intellectual Property Office<br>920 Dunsan-dong, Seo-gu, Daejeon 302-701,<br>Republic of Korea<br>Facsimile No. 82-42-472-7140 | Authorized officer<br><br>MA, Jung Youn<br><br>Telephone No. 82-42-481-5679<br> |

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/001949

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☒ the international application as originally filed/furnished

- ☒ the description:  
pages 1-11 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☒ the claims:  
pages 12-13 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☒ the drawings:  
pages 1-16 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/001949

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

|                               |             |     |
|-------------------------------|-------------|-----|
| Novelty (N)                   | Claims 1-13 | YES |
|                               | Claims NONE | NO  |
| Inventive step (IS)           | Claims NONE | YES |
|                               | Claims 1-13 | NO  |
| Industrial applicability (IA) | Claims 1-13 | YES |
|                               | Claims NONE | NO  |

### 2. Citations and explanations (Rule 70.7)

Reference is made to the following document:

D1 : EP 1,104,897 A2 (23 Oct 2000)

D2 : JP 63- 76033 A (06 Apr 1988)

#### 1. Novelty

Claims 1-17 are considered to be novel over the available prior art, because the prior art does not disclose any of the technical features as specifically set out in the claims of the present application (Article 33(2) PCT).

#### 2. Inventive Step

The subject matter of the present application relates to an apparatus and method for performing garbage collection, characterized in making a list of objects to be removed from a memory, measuring the time left till the predetermined time for responding to a command received from the outside, removing the objects listed in said list from the memory during the left time, storing in the memory the list of the objects which have not been removed during the left time, and then processing said objects during the process of a next command. In other words, the present invention is to distribute and process the garbage collection loads.

D1 is characterized in that during the waiting time that distributed application programs are bit executed, garbage collection is delivered as a function of a certain timing variables and processed.

D2 comprises a first timer circuit for measuring the whole executing time or the time for anything other than garbage collection process and a second timer circuit for measuring the executing time needed for the garbage collection process, characterized by the changing the values of a memory size register.

The present application is similar to said documents in measuring the garbage collection processing time by using a timer and collecting garbage by using the waiting time that an application program is not executed, but differs from said documents in the technology of making a list of objects and storing the list in a memory. However, said technology is known in this art.

Accordingly, it would be obvious to a person skilled in the art to combine the known technologies of D1 and D2, thereby arriving at the present invention. Therefore, the subject matter of claims 1-13 does not fulfill the requirements of Article 33(3) PCT.

#### 3. Industrial Applicability

The present invention is industrially applicable (PCT Article 33(4)).